SERVICE MANUAL

SANYO

DC-SERVO BELT DRIVE ELECTRONIC CONTROL FULL-AUTOMATIC TURNTABLE

TP M15 (EUROPE)

NOTE:
The photo on the cover shows the unit with a "SILVER" front panel. The "BLUE" version is identical in all respects.

SPECIFICATIONS

Motor	DC Servo
Drive System	Belt
Wow & Flutter (WRMS)	0.05 %
Rumble (DIN 45539B)	−65 dB
Platter Diameter	296 mm
Platter Weight	0.8 kg
Record Speed Selector	33/45 rpm
Auto Function	
Start	Yes
Stop	Yes
Reject	Yes
Cueing	Yes
Repeat	Yes
Automatic Tone Arm Return at End of Record	Yes
Manual Function	
Start	Yes
Stop	Yes

Tone Arm Data	
Resonance	<10 Hz
Balance Adjustment	Weight
Effective Length	210 mm
Shape	Straight
Bearing Type	
Horizontal	Thrust
Friction Sensitivity	0.15 gram
Vertical	Pivot
Friction Sensitivity	0.2 gram
Max. Tracking Error	+2.5° ~ −1.5°
Cartridge Supplied	Stereo Magnetic (MG-101S)

GENERAL

Power Requirements	AC: 110/220 V, 50 Hz
Power Consumption	20 Watts
Dimensions (W x D x H)	335 x 100 x 335 mm
Weight (approx.)	5 kg

*Specifications are subject to change without notice.

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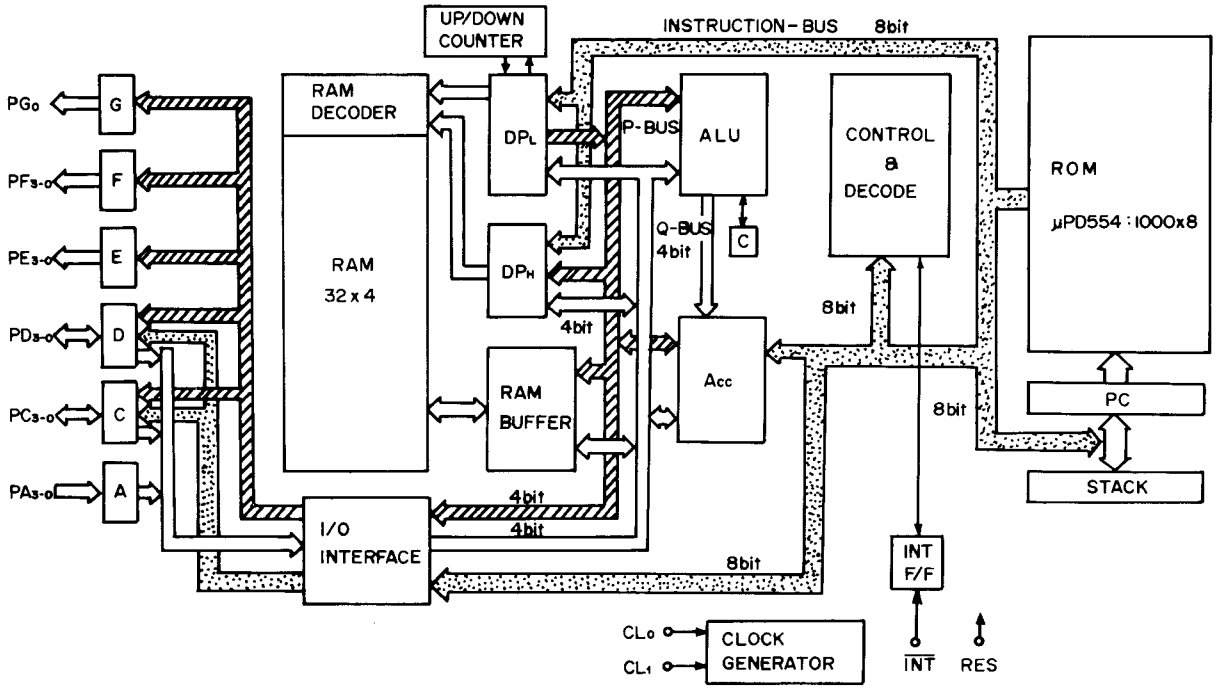
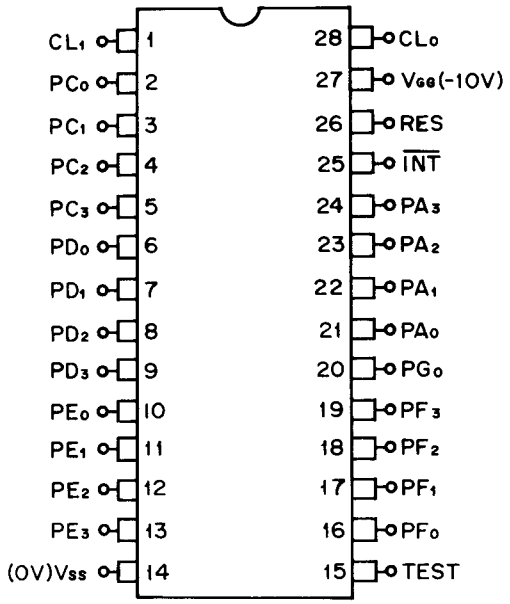
MICROCOMPUTER IC μPD554-017 (μCOM45)

SIGNAL FLOW

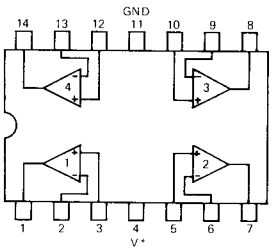


TOP VIEW

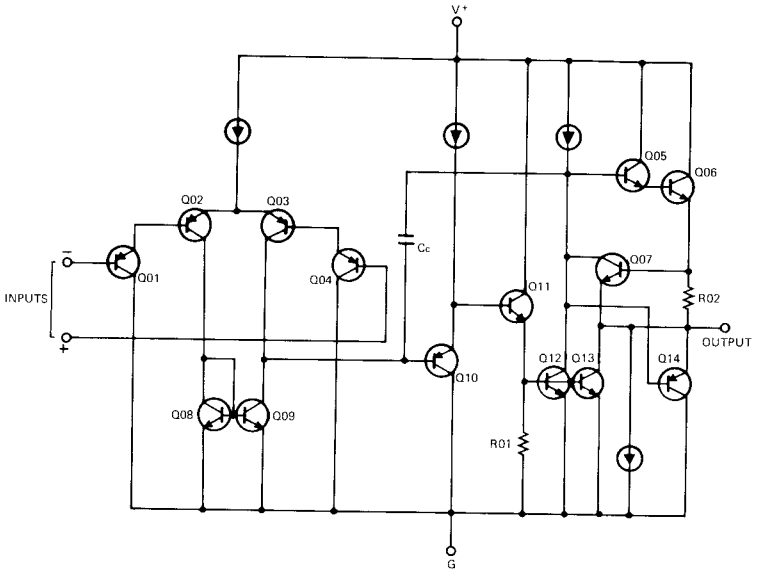


OPERATIONAL AMPLIFIER LA6324

TOP VIEW

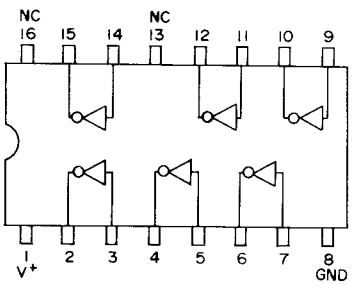


EQUIVALENT CIRCUIT

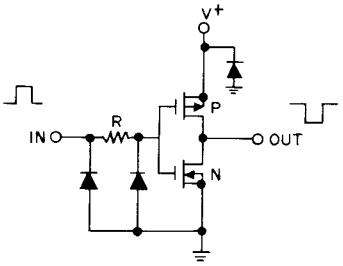


HEX INVERTER LC4049

TOP VIEW

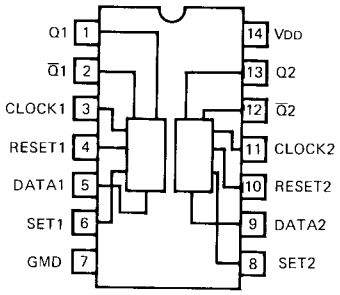


EQUIVALENT CIRCUIT

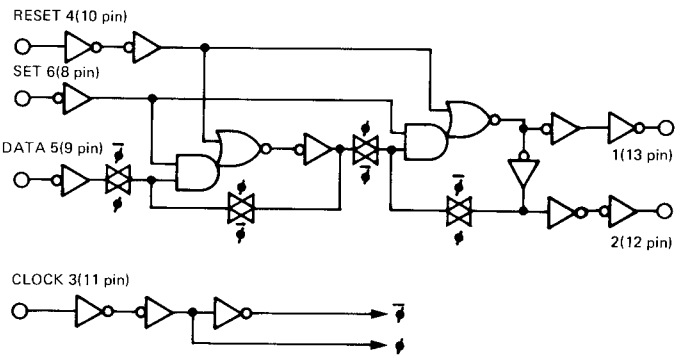


DUAL D-TYPE FLIP-FLOP LC4013

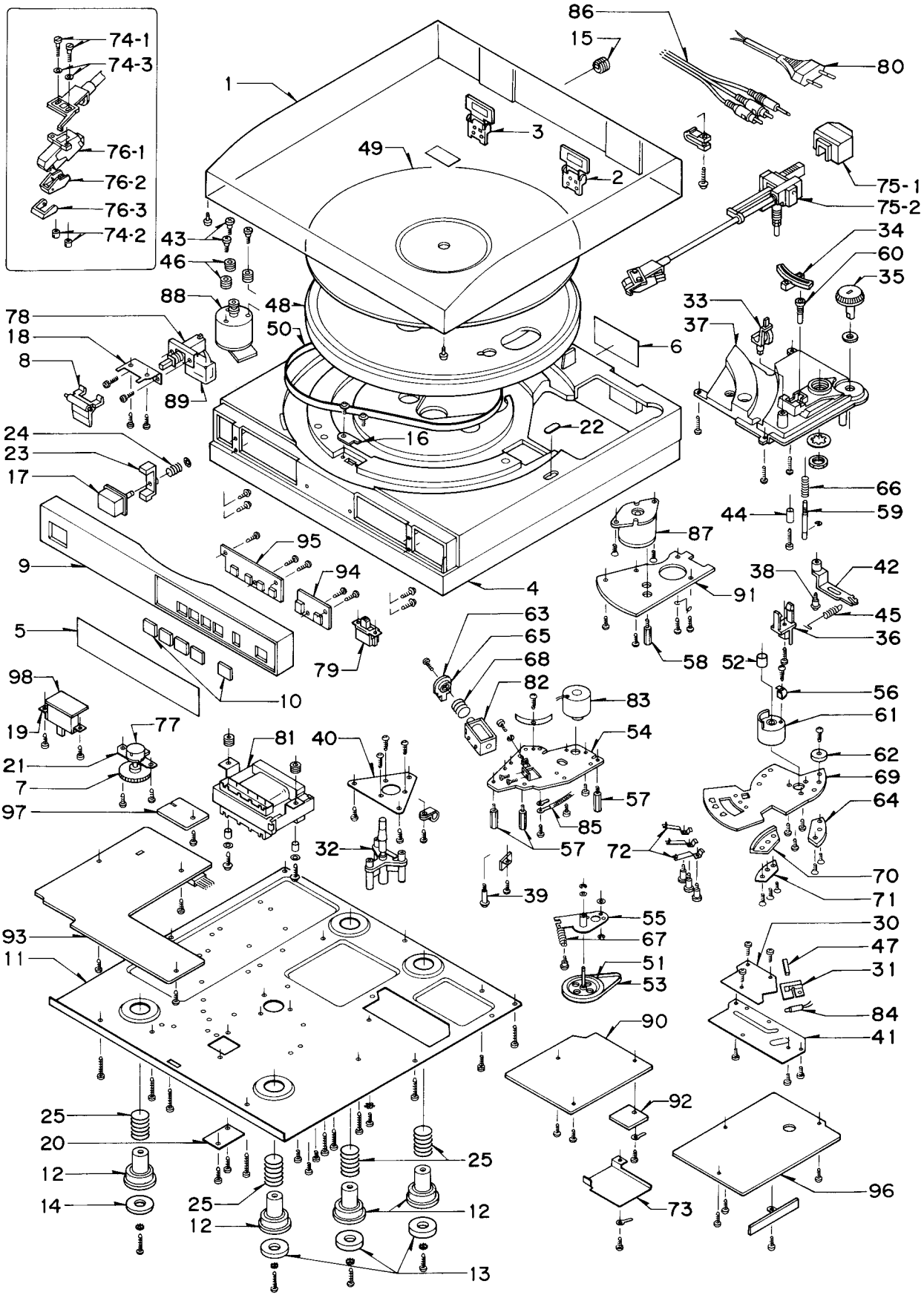
TOP VIEW



EQUIVALENT CIRCUIT



CABINET & TURNTABLE EXPLODED VIEW



PARTS LIST

PACKING PARTS LIST

Ref. No.	Parts Number	Description
	131 6 1169 05901	Box Corrugate-EXP (Silver)
	131 6 1169 05907	Box Corrugate-EXP (Blue)
	131 6 2119 01470	Bag Polyethylene-EXP
	131 6 2119 02081	Bag Polyethylene-EXP
	131 6 2519 00201	Bag Polyethylene-Ind.
	131 6 3009 32860	Pad (Parts Box)
	131 6 3009 33000	Pad (Parts Box Cover)
	131 6 3009 33690	Pad
	131 6 3009 34120	Pad (Right)
	131 6 3009 34130	Pad (Left)
	131 6 3009 34140	Pad
	131 6 4159 10102	Notes
	131 6 4559 10900	Manufacturing No.
	131 6 9459 00100	Rubber Band
	134 2 2104 12300	Screw Transit (+, −)
	134 2 4208 15100	Spacer
	131 6 2519 01300	Bag Polyethylene-Ind.

ACCESSORIES PARTS LIST

Ref. No.	Parts Number	Description
	131 6 2719 10600	Bag Fan
	131 6 4169 02102	Explanatory Booklet (Silver)
	131 6 4169 02107	Explanatory Booklet (Blue)
	134 2 2901 11601	Adaptor EP

CABINET PARTS LIST

Ref. No.	Parts Number	Description
1	131 0 2022 90300	Lid Assy
	131 2 1107 26200	Lid
	131 2 1310 22101	Name Plate
	131 2 2904 13401	Pad Lid
2	131 0 2002 16801	Hinge Assy
3	131 0 2002 16802	Hinge Assy
4	131 2 1101 48003	Cabinet (Silver)
4	131 2 1101 48006	Cabinet (Blue)
5	131 2 1203 58100	Panel Control (Silver)
5	131 2 1203 61300	Panel Control (Blue)
6	131 2 1310 34612	Name Plate
7	131 2 1601 56800	Knob
8	131 2 2108 02500	Hinge
9	131 2 3305 34501	Panel Front (Silver)
9	131 2 3305 34503	Panel Front (Blue)
10	131 2 4208 42200	Spacer
11	131 2 1105 29501	Plate Bottom
12	131 0 1003 14500	Leg Assy
13	131 2 5203 23602	Felt (Leg)
14	131 2 5203 23603	Felt
15	131 2 6111 21300	Bushing (SR-4P-4)
16	131 2 7104 00101	Plate Pad Switch
17	134 2 1601 19200	Knob
18	134 2 2604 10900	Angle Switch
19	134 2 2604 11300	Angle Switch
20	134 2 4108 27700	Plate
21	134 2 4108 31300	Plate VR
22	134 2 4108 31700	Plate (Silver)
22	134 2 4108 31703	Plate (Blue)
23	134 2 4121 12800	Guide
24	134 2 5101 35000	Spring
25	134 2 5102 15001	Spring Mounting

CABINET PARTS LIST

Ref. No.	Parts Number	Description
*	131 2 4220 10502	Ring Snap 17 – 1
*	131 2 4201 21100	Screw 9 – 4
*	131 2 4201 20800	Screw 2.6x6 9 – 7, 19 – 2
*	131 2 4201 19501	Screw (Screw, Button Head Tapping B-TITE 3) 18 – 2, 21 – 2, 4 – 4, 9 – 3, 4 – 3, 4 – 1
*	131 2 4201 27103	Screw (Screw, Binding Head Tapping B-TITE 3) 11 – 3, 11 – 2, 11 – 10, 12 – 4
*	131 2 4201 25205	Screw (B TITE SEMS) 4 – 2
*	131 2 4201 19701	Screw, Pan Head 2.6x5 19 – 2
*	131 2 4201 19900	Screw (SEMS 3x6) 18 – 2, 11 – 2
*	131 2 4201 20300	Screw TP 16 – 2
*	134 2 4203 02700	Washer 12 – 4

TURNTABLE PARTS LIST

Ref. No.	Parts Number	Description
30	131 2 3110 01200	Plate Pad Wire
31	131 2 6113 46200	Shelter
32	134 0 5015 10400	Shaft Turntable Assy
33	134 0 6031 12201	Arm Rest Assy
34	134 0 6042 11100	Plate Lifting Assy
35	134 2 1601 19002	Knob (Silver)
35	134 2 1601 19005	Knob (Blue)
36	134 2 2106 12400	Holder
37	134 2 3201 13300	Base Pick-up (Silver)
37	134 2 3201 13305	Base Pick-up (Blue)
38	134 2 4106 21801	Shaft
39	134 2 4106 27600	Shaft
40	134 2 4108 31800	Plate Turntable Shaft
41	134 2 4108 31900	Plate Base
42	134 2 4123 21500	Arm
43	134 2 4201 13600	Screw
44	134 2 4208 16600	Spacer
45	134 2 5101 29400	Spring
46	134 2 5202 11800	Rubber Cushion
47	134 2 5205 15200	Cushion
48	134 2 6101 13800	Turntable
49	134 2 6102 15802	Mat Turntable
50	134 2 6302 11600	Belt
*	131 2 4201 20800	Screw 2.6x6 36 – 1
*	131 2 4201 20804	Screw 33 – 1
*	131 2 4201 20706	Screw 44 – 1
*	102 3 2203 00601	Screw, Button Head Tapping 3.0x6 32 – 3

PARTS LIST (Continued)

TURNTABLE PARTS LIST

Ref. No.	Parts Number	Description
*	131 2 4201 19501	Screw (Screw, Button Head Tapping B-TITE 3) 40 – 1, 37 – 3
*	131 2 4201 13505	Screw 30 – 3
*	131 2 4201 19900	Screw (SEMS 3x6) 31 – 1, 38 – 2
*	131 2 4201 25205	Screw (B TITE SEMS) 40 – 2
*	131 2 4203 16402	Washer 35 – 1
51	131 0 3020 11700	Pulley Assy
52	131 2 4208 26801	Spacer
53	131 2 4804 00300	Rubber Belt
54	134 0 6037 12300	Base Assy
55	134 0 6038 00400	Arm Clutch Assy
56	134 2 2403 24300	Angle Mount
57	134 2 4106 27801	Shaft
58	134 2 4106 27900	Shaft
59	134 2 4116 13800	Spindle Lifting
60	134 2 4118 19101	Boss
61	134 2 4118 19301	Boss
62	134 2 4119 11800	Weight
63	134 2 4121 12400	Guide
64	134 2 4203 02900	Washer Weight
65	134 2 4208 15400	Spacer
66	134 2 5101 34400	Spring
67	134 2 5102 14101	Spring Arm
68	134 2 5102 14200	Spring Solenoid
69	134 2 4108 30800	Plate Control
70	134 2 4131 00500	Rubber Friction
71	134 2 4203 03400	Washer Weight
*	101 3 1203 00501	Screw, Flat Head 3.0x5 71 – 3
72	134 2 5103 11100	Spring Shelter
*	141 2 4219 14000	Screw 72 – 3
*	131 2 4206 12000	Ring E 59 – 2, 51 – 1
*	108 3 1103 00007	Ring E 3.0 55 – 1
*	101 3 1103 00603	Screw, Pan Head 3.0x6
*	131 2 4201 13505	Screw
*	101 3 1103 00401	Screw, Pan Head 3.0x4
*	101 3 1203 00604	Screw, Flat Head 3.0x6
*	131 2 4201 19900	Screw (SEMS 3x6) 63 – 1
*	131 2 4201 20800	Screw 2.6x6 56 – 1
*	131 2 4201 23702	Screw 69 – 2
*	131 2 4201 19502	Screw (Screw Button Head Tapping B-TIPE 3) 69 – 1
*	131 2 4201 15203	Screw M4x10 61 – 2
*	141 2 4219 09000	Screw
*	131 2 4201 13700	Screw (TAPTITE) 3x6 64 – 2

TURNTABLE PARTS LIST

Ref. No.		Parts Number	Description
*		131 2 4201 19501	Screw (Screw Button Head Tapping B-TITE 3) 62 – 1
*		105 3 1204 00001	Washer, Spring 4.0 54 – 1
*		131 2 4203 83222	Washer, Plain 3.2x8x0.3 55 – 1
*		131 2 4203 84233	Washer, Plain 4.2x10x0.3 54 – 1
*		131 2 4203 83200	Washer, Plain 3.2x8x0.5 57 – 3
73		131 2 6103 21300	Cover Shield
74		134 0 4009 03301	Pick-up Assy
75		134 0 4001 10701	Tone Arm Assy
75-1		134 0 4003 03500	Pick-up Weight Assy
75-2		134 0 4004 05201	Pick-up Arm Assy
76		134 0 4008 00200	Cartridge Assy
76-1		4 1579 27040	Cartridge
76-2		4 1579 29460	Stylus
76-3		134 2 1402 12800	Retainer Needle
74-1		134 2 4201 11310	Screw (–) 2.6x9
74-2		134 2 4202 11301	Nut
74-3		134 2 4203 01800	Washer
*		131 2 4201 19501	Screw (Screw Button Head Tapping B-TITE 3) 73 – 1
*		131 2 4203 20200	Washer 74 – 1
77		4 2222 02760	VR 100k-Bx1
78	⚠	4 2312 05060	Switch Push Power
79	⚠	4 2312 02650	Switch Slide 3P
80	⚠	4 2432 00071	Line Cord
81	⚠	4 2512 18921	Power Transformer
82		4 2642 00040	Plunger
83		4 5272 00011	Commutate Mot. Magnet
84		4 6122 02130	Pilot Lamp
85		131 0 4004 16000	Wire Shield Assy
86		131 0 4004 16500	Wire Shield Assy
87		134 0 5011 01004	Motor Assy (Up/Down)
88		134 0 5011 02801	Motor Assy
89	⚠	C2EFRM103C-S	Mylar 0.01 μF 250V ±20%
90		131 0 4001 12062	Power Supply P.C.B. Assy
91		131 0 4001 08771	Mecha P.C.B. Assy
92		131 0 4001 10860	Phono P.C.B. Assy
93		131 0 4001 12050	Control P.C.B. Assy
94		131 0 4001 12100	L.E.D. Indicator P.C.B. Assy
95		131 0 4001 12090	Touch Switch P.C.B. Assy
96		131 0 4001 12080	Auto Function P.C.B. Assy
97		131 0 4001 12070	Stop P.C.B. Assy
98		131 0 4001 12310	Sensor Switch P.C.B. Assy

Note: * Asterisk indicates not a service part. The numbers for screws, nuts, and washers, shown in Description, correspond with Ref. Nos. of the parts using these screws, nuts and washers.

Example: 3 – 2

3 means	**Ref. No.**
2 means	**Q'ty.**

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

ADJUSTMENT

As all adjustments must be performed with the bottom plate mounted on the cabinet, the ADJUSTING JIG in Fig. 1 is required to obtain correct adjustments.
Insert the jig from Ⓐ in Fig. 2 into the 7P plug on the Control P.C.Board and pull out the test points. Then, perform the adjustments.

Note: Perform the adjustments in the described order.

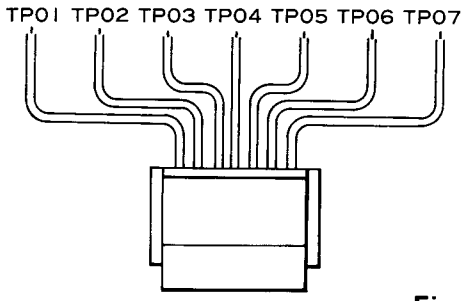


Fig. 1

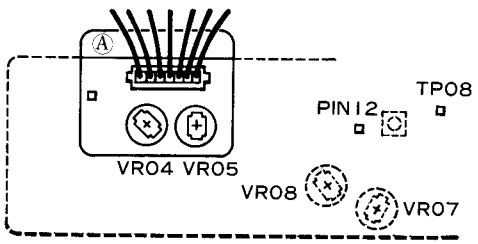


Fig. 2

CLOCK OSCILLATION FREQUENCY ADJUSTMENT

1. Remove the bottom plate and connect the frequency counter to Pin 12 (GND) and TP08 (+).

2. Adjust L01 for 400 kHz±1 kHz.

STYLUS HEIGHT ADJUSTMENT

1. Mount the bottom plate on the cabinet.

2. Disengage the turntable belt from the motor to prevent the turntable from rotating.

3. Set the tone arm in "Cueing Up" mode and turn the stylus height adjusting screw in Fig. 3 until the stylus height becomes 7.8 mm away from the surface of the turntable.

   Note: If the bottom plate has been already removed, the readjustment is required with the bottom plate mounted on the cabinet.

PC1 GAIN ADJUSTMENT

1. Insert the adjusting jig into the 7P plug.

2. Connect the DC voltmeter to TP01 (–) and TP02 (+).

3. Place the STANDARD REFLECTOR on the turntable and move the cartridge in "Cueing Up" mode over the REFLECTOR. Then, adjust VR06 until the voltmeter reads 3.2 V±0.2 V.

4. If the correct adjustment cannot be obtained in the above procedure, cut off R39 (330 K) and perform the above adjustment again.

   Note: If the bottom plate has been already removed, the readjustment is required with the plate mounted on the cabinet.

ADJUSTMENT (Continued)

RETURN ADJUSTMENT

1. Set VR02 to "Mechanical Center" position and adjust the return point by turning it either clockwise (inward) or counterclockwise (outward), so that the return action takes place at the end of music.

2. Adjust VR02, so that the returning arm lowers exactly at the armrest.

PHOTOTRANSISTOR SENSITIVITY ADJUSTMENT

1. Short-circuit TP04 and TP05 with the resistor (150 ohms).

2. Connect the DC voltmeter to TP06 (+) and TP91 (–).

3. The voltage changes when the tone arm in "Cueing Up" mode is moved towards the center over the turntable. Adjust VR03 until the voltage becomes 50 mV ±5 mV at the low point.

READ-IN ADJUSTMENT

1. When the pickup is set at the 30 cm read-in position with the turntable removed, the mechanical trimmer can be observed through the hole Ⓐ in Fig. 4.
   The pickup lowering position moves inward when the trimmer is moved to the right and it moves outward when the trimmer is moved to the left.

2. Adjust the mechanical trimmers for the 25 cm and 17 cm read-in positions by following the same procedure as described above.

MUSIC SELECTION ADJUSTMENT

1. Set the Approach VR to "Center Click" position.

2. Select a music program near the outer circumference of a record and a program near the inner circumference and check for the malselection.
   If the beginning or the last portion of music is not played, adjust VR04 and VR05.
   Note: VR04 and VR05 are connected in series.

3. Check the read-in position changes by turning the APPROACH knob.

SPEED ADJUSTMENT

1. Set the SPEED SELECT button to "33" position and adjust VR07 until the speed becomes 33 1/3 rpm. Use a strobosheet on the market for the measurement.

2. Set the SPEED SELECT button to "45" position and adjust VR08 for the correct speed.
   Note: Be sure to perform this adjustment after the "33" speed adjustment.

ADJUSTMENT (Continued)

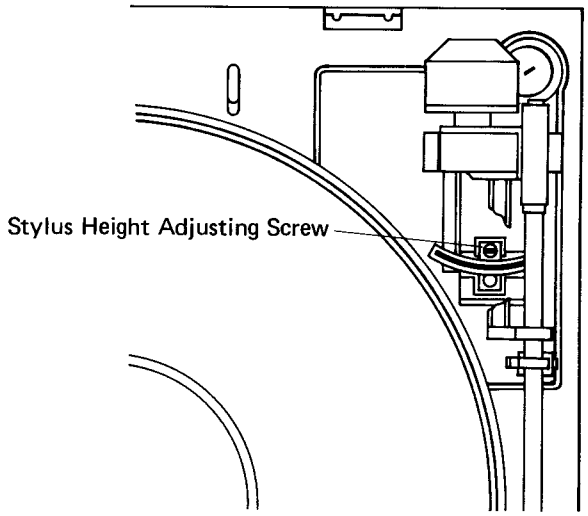


Fig. 3

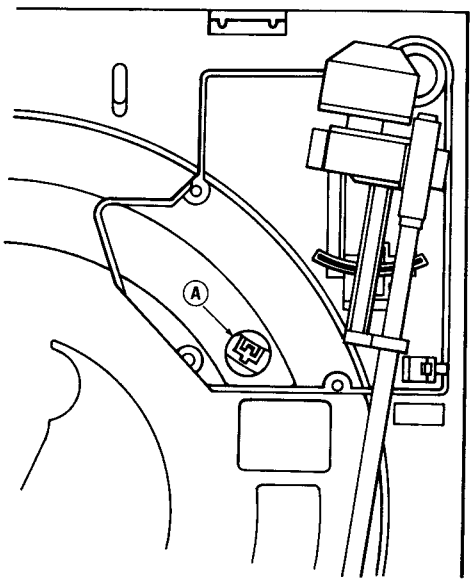


Fig. 4

LOCATION OF VRs

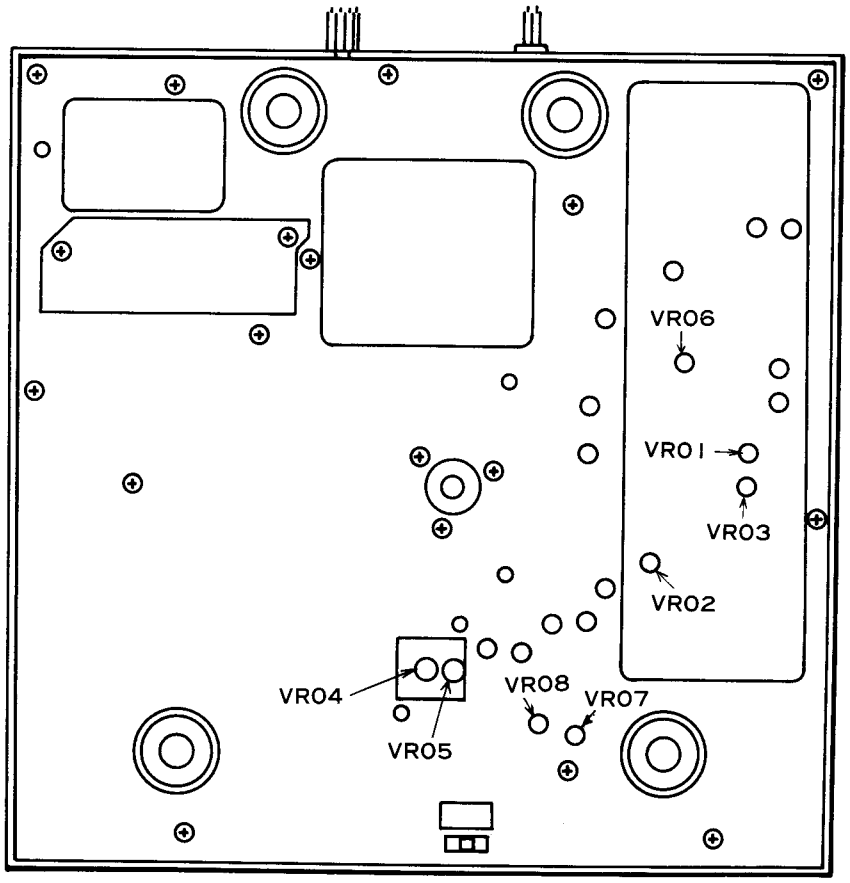


Fig. 5

CARTRIDGE REPLACEMENT

The cartridge has a sensor which detects "Silent Space" between music programs.
As the sensor leads are not plug-in type, replace the cartridge by following the steps as described below.

1. Remove the bottom plate of the unit and unsolder the three leads Ⓐ . (See Fig. 6)

2. Remove the screw holding the cartridge and disconnect the plug-in type leads (Signal Leads). Then, pull out the cartridge to the extent that the leads removed in Step 1 do not enter into the tone arm.

3. Remove the upper lid of the cartridge and the printed circuit board. Then, unsolder the leads. (See Fig. 7)

4. Solder the leads removed in Step 3 and mount the cartridge on the arm.

5. Connect the three leads Ⓐ in Fig. 6 to the printed circuit board.

6. Perform the overhung adjustment of the cartridge. (See Fig. 8)

   Note: Readjustment of the unit is required after the cartridge replacement.

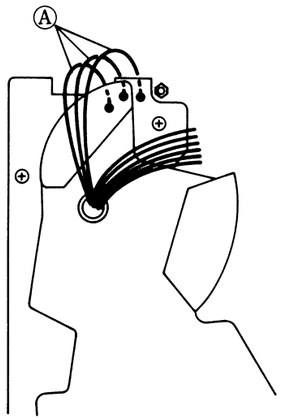


Fig. 6

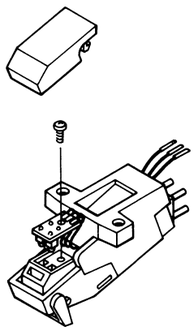
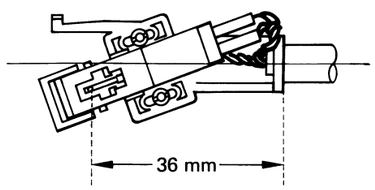


Fig. 7



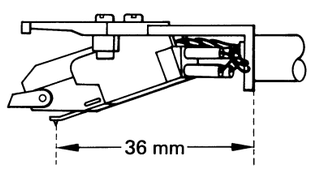
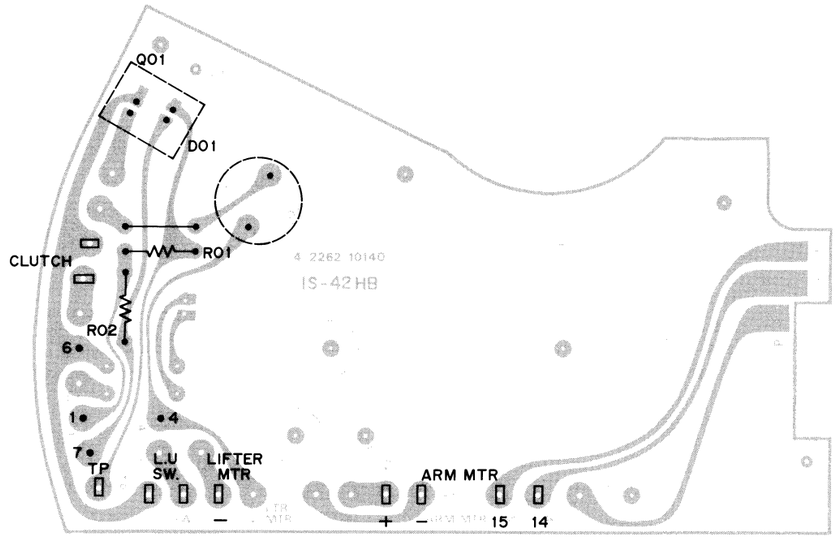
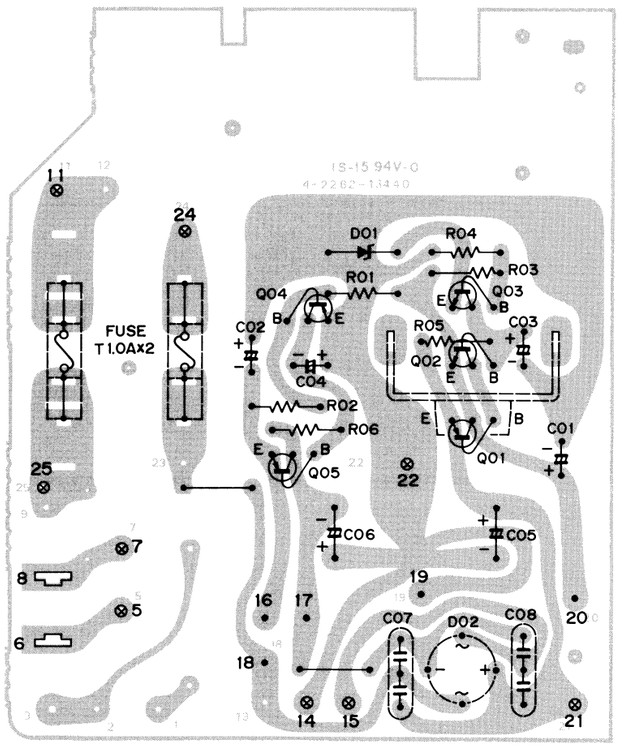


Fig. 8

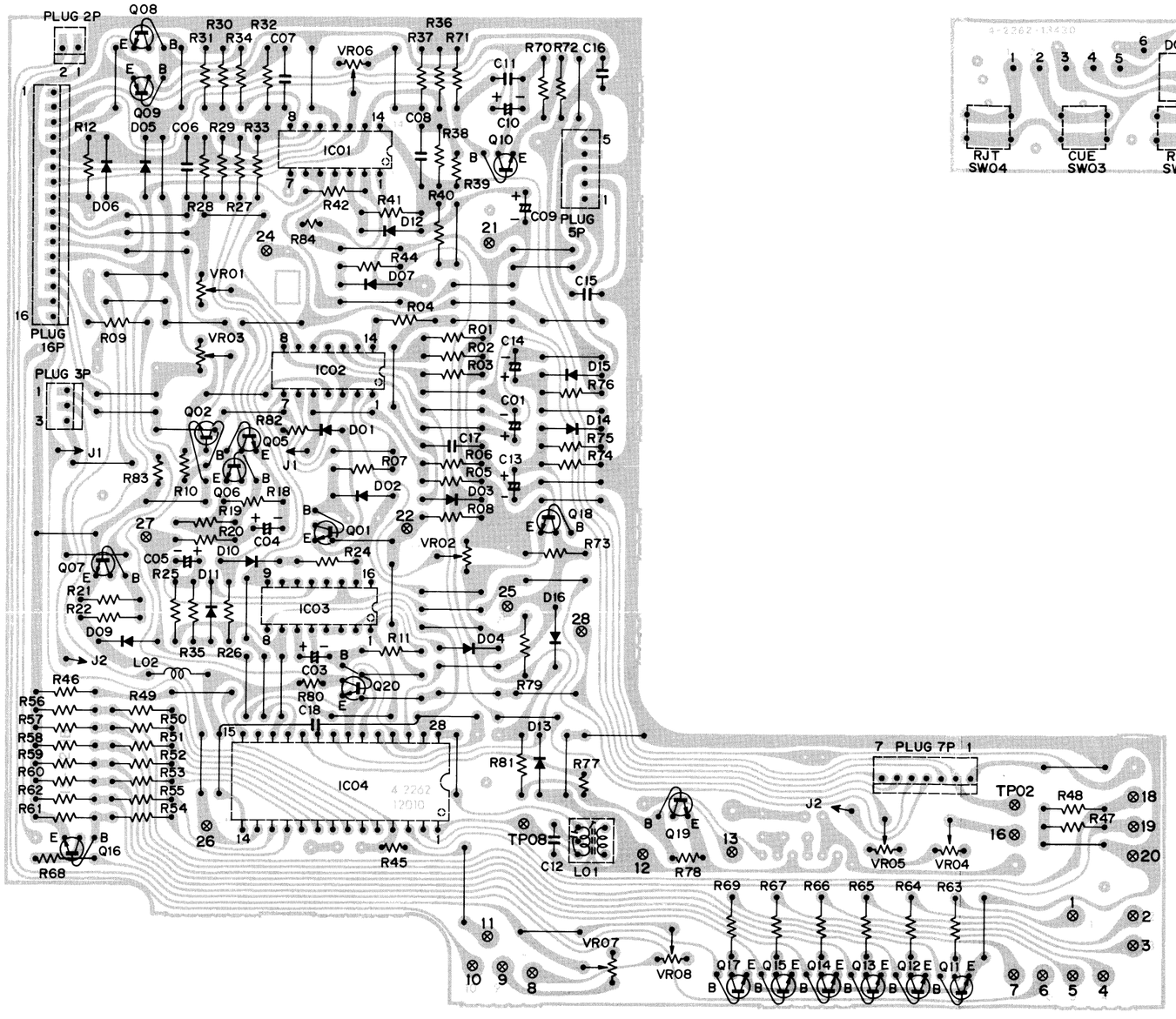
MECHA P.C.BOARD
(BOTTOM VIEW)



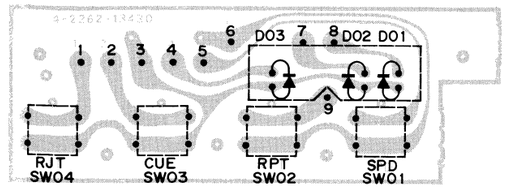
POWER SUPPLY P.C.BOARD
(BOTTOM VIEW)



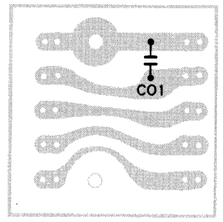
CONTROL P.C.BOARD
(BOTTOM VIEW)



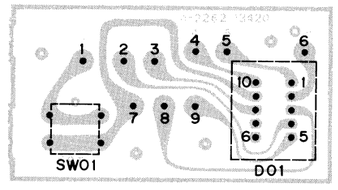
TOUCH SWITCH P.C.BOARD
(BOTTOM VIEW)



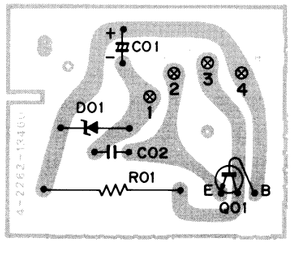
PHONO P.C.BOARD
(BOTTOM VIEW)



L.E.D. INDICATOR P.C.BOARD
(BOTTOM VIEW)

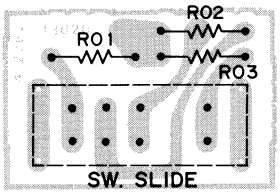


STOP P.C.BOARD
(BOTTOM VIEW)



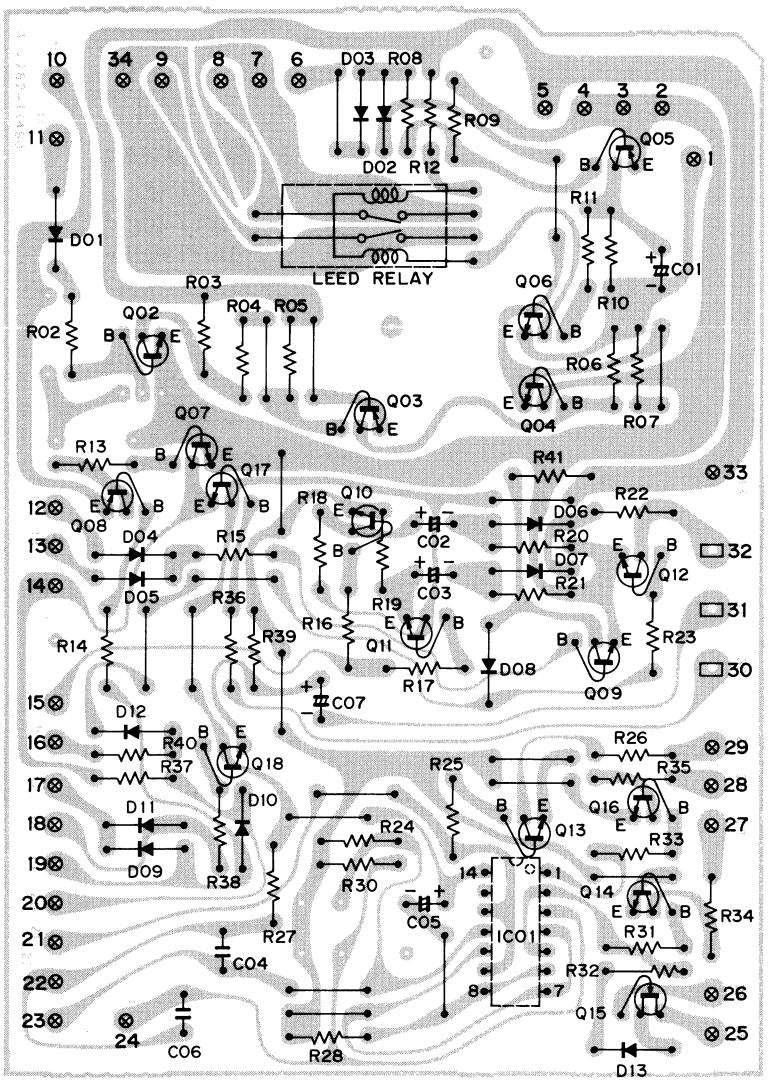
SENSOR SWITCH P.C.BOARD

(BOTTOM VIEW)



AUTO FUNCTION P.C.BOARD

(BOTTOM VIEW)



PARTS LIST

POWER SUPPLY P.C.B. Assy
131 0 4001 12062

Ref. No.	Parts Number	Description
	⚠ 4 2349 20380	Fuse T1.0 A
	4 2352 00200	Fuse Clip
	4 2372 00830	EC Terminal 1P
	131 0 4006 32400	Cord Assy
	131 2 6201 21500	Plate Heat Sink
	CAPACITORS	
C01	C1CRE-227A	Electrolytic 220 μF 16V
C02	C1CRE-476A	Electrolytic 47 μF 16V
C03,04	C1HRE-474A	Electrolytic 0.47 μF 50V
C05,06	4 2232 00690	Electrolytic 2200 μF 25V
C07,08	⚠ 4 2232 00430	Ceramic 0.01 μFx2 250V
	SEMICONDUCTORS	
D01	DNN-RD9R1EB1	Diode, RD9.1EB1
D02	DGG-W02	Bridge Diode, W02
Q01	203 5 8530 51450	TR 2SB514 E, F
Q02,03	203 5 5000 53650	TR 2SC536 E, F
Q04	203 5 7230 60850	TR 2SA608 E, F
Q05	203 5 7350 76450	TR 2SB764 E, F
	RESISTORS	
R01	R2EDPJ123A	Carbon 12k 1/4W ±5%
R02	R2EDPJ103A	Carbon 10k 1/4W ±5%
R03	R2EDPJ102A	Carbon 1k 1/4W ±5%
R04	R2EDPJ562A	Carbon 5.6k 1/4W ±5%
R05	R2EDPJ332A	Carbon 3.3k 1/4W ±5%
R06	R2EDBJ102A	Carbon 1.0k 1/4W ±5%

MECHA P.C.B. Assy
131 0 4001 08771

Ref. No.	Parts Number	Description
	4 2082 00020	LW12C
	4 2372 00060	Receptacle
	131 0 4006 32322	Cord Assy
	131 0 4006 32328	Cord Assy
	131 0 4006 32329	Cord Assy
	131 0 4006 32330	Cord Assy
	131 0 4006 34802	Cord Assy
	SEMICONDUCTORS	
D01	DO0-SLP-114A	Diode, SLP-114A
Q01	TO0-SPS-102	TR SPS-102
	RESISTORS	
R01	R2EDPJ221A	Carbon 220 1/4W ±5%
R02	R2EDPJ121A	Carbon 120 1/4W ±5%

PHONO P.C.B. Assy
131 0 4001 10860

Ref. No.	Parts Number	Description
	CAPACITOR	
C01	C1HYDZ103A	Ceramic 0.01 μF 50V +80,–20%

CONTROL P.C.B Assy
131 0 4001 12050

Ref. No.	Parts Number	Description
	4 2362 00080	Plug 3P
	4 2362 00130	Plug 7P
	4 2362 00770	Plug 2P
	4 2362 00800	Plug 16P
	4 2369 22740	Plug 5P
L01	4 2562 00040	IF Transformer AM
L02	4 2532 00530	Choke Coil 39 μH
VR01	4 2222 02660	VR 22k-B
VR02	4 2222 02680	VR 100k-B
VR03	4 2222 02650	VR 4.7k-B
VR04	4 2222 02680	VR 100k-B
VR05	4 2222 02680	VR 100k-B
VR06	4 2222 02690	VR 220k-B
VR07	4 2222 02670	VR 47k-B
VR08	4 2222 02660	VR 22k-B
	CAPACITORS	
C01	C1ARE-107A	Electrolytic 100 μF 10V
C03	C1CRY-106APA	Electrolytic 10 μF 16V
C04	C1ARY-476APA	Electrolytic 47 μF 10V
C05	C1HREK105BL	Electrolytic 1 μF 50V ±10%
C06	C1ECZN103XPA	Ceramic 0.01 μF 25V ±30%
C07	C1ECZK331BPA	Ceramic 330 pF 25V ±10%
C08	C1HCZK102BPA	Ceramic 1000 pF 50V ±10%
C09,10	C1HRY-225APA	Electrolytic 2.2 μF 50V
C11	C1HFRK223A	Mylar 0.022 μF 50V ±10%
C12	C1HSEJ471A	Styrol 470 pF 50V ±5%
C13	C1VRY-226APA	Electrolytic 22 μF 35V
C14	C1HRY-106APA	Electrolytic 10 μF 50V
C15,16	C1HYYZ473APA	Ceramic 0.047 μF 50V +80,–20%
C17	C1HCZK102BPA	Ceramic 1000 pF 50V ±10%
C18	C1HFRK104A	Mylar 0.1 μF 50V ±10%
	SEMICONDUCTORS	
D01,02 03,04	205 5 9040 44210	Diode, DS-442
D05,06	202 5 2470 13540	Diode, DS135D
D07,09 10,11 12,13 14	205 5 9040 44210	Diode, DS-442
D15	202 5 2470 13540	Diode, DS135D
D16	205 5 9040 44210	Diode, DS-442
IC01,02	206 5 1296 32410	IC, LA6324
IC03	206 5 8584 04910	IC, LC4049
IC04	4 9362 00010	IC, μPD554-017
Q01,02	203 5 5000 53650	TR 2SC536 E, F
Q05	203 5 7340 86350	TR 2SD863 E, F
Q06	203 5 5000 53650	TR 2SC536 E, F

PARTS LIST (Continued)

Ref. No.	Parts Number	Description
	SEMICONDUCTORS	
Q07	203 5 7340 86360	TR 2SD863 E
Q08	203 5 7340 86350	TR 2SD863 E, F
Q09	203 5 7350 76450	TR 2SB764 E, F
Q10	203 5 5000 53670	TR 2SC536 G
Q11,12	203 5 5000 53650	TR 2SC536 E, F
13,14		
15,16		
17,18		
Q19	203 5 7340 86350	TR 2SD863 E, F
Q20	203 5 5000 53650	TR 2SC536 E, F
	RESISTORS	
R01	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R02	R2EDZJ152APA	Carbon 1.5k 1/4W ±5%
R03	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R04	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R05	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R06	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R07	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R08	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R09	R2EDZJ681APA	Carbon 680 1/4W ±5%
R10	R2EDUJ223A	Carbon 22k 1/4W ±5%
R11	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R12	R2EDZJ471APA	Carbon 470 1/4W ±5%
R18,19	R2EDZJ103APA	Carbon 10k 1/4W ±5%
20		
R21,22	R2EDZJ562APA	Carbon 5.6k 1/4W ±5%
R24,25	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R26	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R27	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R28	R2EDZJ4R7APA	Carbon 4.7 1/4W ±5%
R29,30	R2EDZJ471APA	Carbon 470 1/4W ±5%
31		
R32	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R33	R2EDZJ123APA	Carbon 12k 1/4W ±5%
R34	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R35	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R36	R2EDZJ273APA	Carbon 27k 1/4W ±5%
R37	R2EDZJ333APA	Carbon 33k 1/4W ±5%
R38	R2EDZJ105APA	Carbon 1M 1/4W ±5%
R39	R2EDUJ334A	Carbon 330k 1/4W ±5%
R40,41	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R42	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R44	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R45	R2EDUJ103A	Carbon 10k 1/4W ±5%
R46,47	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R48	R2EDZJ154APA	Carbon 150k 1/4W ±5%
R49,50	R2EDZJ103APA	Carbon 10k 1/4W ±5%
51,52		
53,54		
55,56		
57,58		
59,60		
61,62		
R63,64	R2EDZJ102APA	Carbon 1k 1/4W ±5%
65,66		
67,68		
69		

Ref. No.	Parts Number	Description
	RESISTORS	
R70	R2EDZJ122APA	Carbon 1.2k 1/4W ±5%
R71	R2EDZJ154APA	Carbon 150k 1/4W ±5%
R72	R2EDZJ682APA	Carbon 6.8k 1/4W ±5%
R73	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R74	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R75	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R76	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R77,78	R2EDUJ103A	Carbon 10k 1/4W ±5%
R79	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R80	R2EDUJ223A	Carbon 22k 1/4W ±5%
R81	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R82	R2EDPJ222A	Carbon 2.2k 1/4W ±5%
R83	R2HXPK391A	Oxide Metal Film 390 1/2W ±10%
R84	R2EDUJ183A	Carbon 18k 1/4W ±5%
R85	R2EDPJ101A	Carbon 100 1/4W ±5%

L.E.D. INDICATOR P.C.B. Assy
131 0 4001 12100

Ref. No.	Parts Number	Description
SW01	4 2312 05800	Keyboard Switch
	131 0 4006 32302	Cord Assy
	131 0 4006 32305	Cord Assy
	131 0 4006 32312	Cord Assy
	131 0 4006 32317	Cord Assy
	131 0 4006 32319	Cord Assy
	131 0 4006 32323	Cord Assy
	131 0 4006 32325	Cord Assy
	131 0 4006 32327	Cord Assy
	SEMICONDUCTOR	
D01	DYY-LA-301VB	L.E.D., LA-301VB (Red)

TOUCH SWITCH P.C.B. Assy
131 0 4001 12090

Ref. No.	Parts Number	Description
SW01	4 2312 05800	Keyboard Switch (Speed)
SW02	4 2312 05800	Keyboard Switch (Repeat)
SW03	4 2312 05800	Keyboard Switch (Cue)
SW04	4 2312 05800	Keyboard Switch (Reject)
	131 0 4006 32313	Cord Assy
	131 0 4006 32314	Cord Assy
	131 0 4006 32316	Cord Assy
	131 0 4006 32318	Cord Assy
	131 0 4006 32320	Cord Assy
	131 0 4006 32321	Cord Assy
	131 0 4006 32324	Cord Assy
	131 0 4006 32326	Cord Assy
	131 0 4006 32331	Cord Assy
	131 2 4208 42300	Spacer
	SEMICONDUCTORS	
D01,02	DOO-SLP-114B	L.E.D., SLP-114B
03		

PARTS LIST (Continued)

AUTO FUNCTION P.C.B. Assy
131 0 4001 12080

Ref. No.	Parts Number	Description
	4 2329 20230	Relay Leed
	4 2372 00060	Receptacle
	CAPACITORS	
C01	C1CRY-476APA	Electrolytic 47 μF 16V
C02,03	C1HRY-105APA	Electrolytic 1 μF 50V
C04	C1HYYK682RPA	Ceramic 6800 pF 50V ±10%
C05	C1HRY-105APA	Electrolytic 1 μF 50V
C06	C1HYYK682RPA	Ceramic 6800 pF 50V ±10%
C07	C1CRY-336APA	Electrolytic 33 μF 16V
	SEMICONDUCTORS	
D01,02 03,04 05,06 07,08 09,10 11,12 13	205 5 9040 44210	Diode, DS-442
IC01	206 5 9464 01310	IC, LC4013B
Q02	203 5 5000 53650	TR 2SC536 E, F
Q03	203 5 7230 60850	TR 2SA608 E, F
Q04	203 5 5000 53650	TR 2SC536 E, F
Q05	203 5 7230 60850	TR 2SA608 E, F
Q06,07	203 5 5000 53650	TR 2SC536 E, F
Q08	203 5 7230 60850	TR 2SA608 E, F
Q09,10 11,12 13,14	203 5 5000 53650	TR 2SC536 E, F
Q15	203 5 4370 30460	FET 2SK304 F
Q16,17 18	203 5 5000 53650	TR 2SC536 E, F
	RESISTORS	
R02	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R03	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R04,05 06	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R07	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R08	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R09	R2EDZJ333APA	Carbon 33k 1/4W ±5%
R10	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R11	R2EDZJ123APA	Carbon 12k 1/4W ±5%
R12	R2EDZJ561APA	Carbon 560 1/4W ±5%
R13,14 15,16 17	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R18,19	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R20,21	R2EDZJ474APA	Carbon 470k 1/4W ±5%
R22	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R23	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R24	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R25	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R26,27	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R28	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R30	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R31	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R32	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R33	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R34,35	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R36	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R37	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R38	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R39	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R40	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R41	R2EDZJ223APA	Carbon 22k 1/4W ±5%

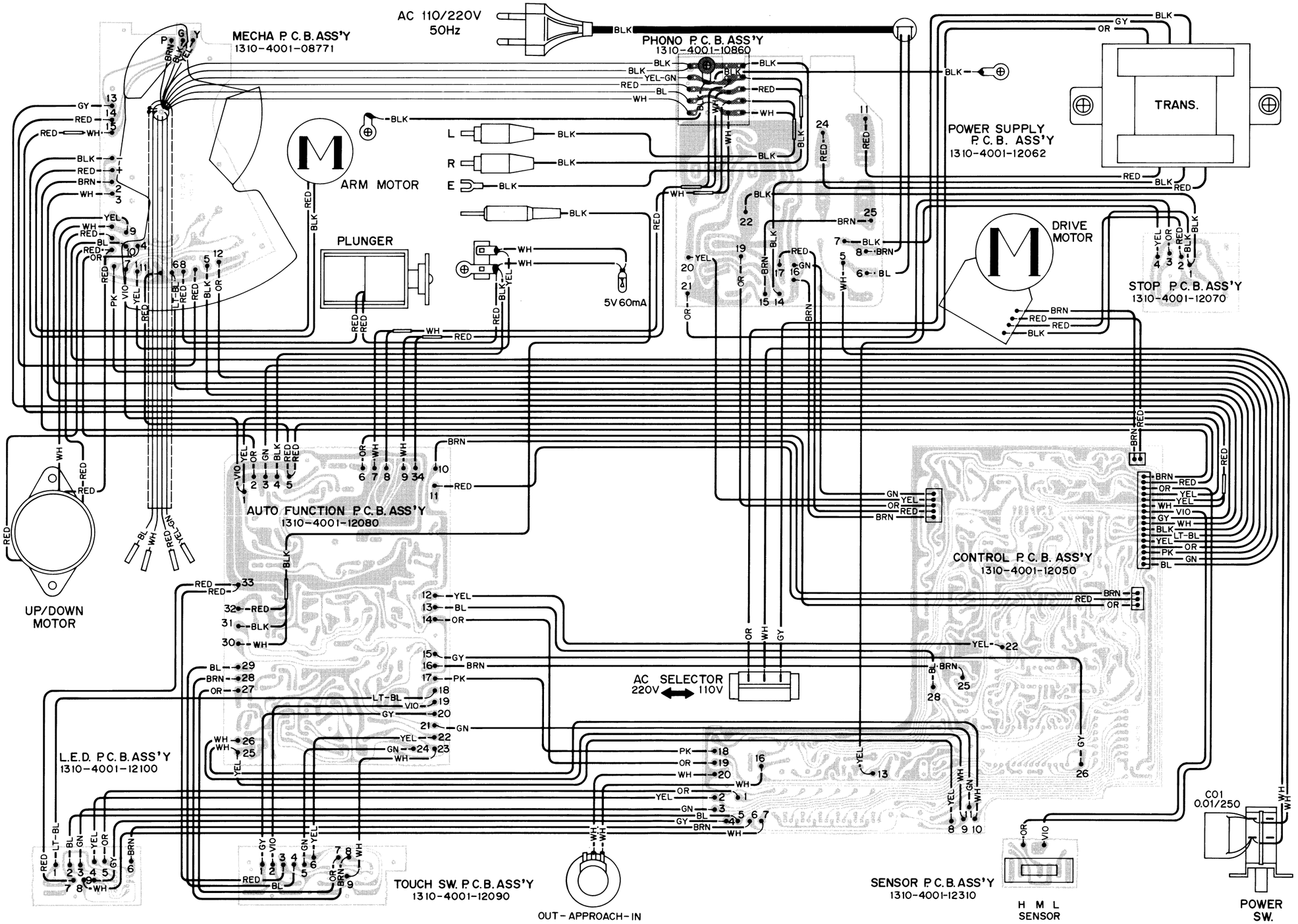
STOP P.C.B. Assy
131 0 4001 12070

Ref. No.	Parts Number	Description
	CAPACITORS	
C01	C1CRE-477A	Electrolytic 470 μF 16V
C02	C1HYDZ473A	Ceramic 0.047 μF 50V +80,–20%
	SEMICONDUCTORS	
D01	202 5 3210 12012	Zener Diode, GZA12Y
Q01	203 5 7340 86350	TR 2SD863 E, F
	RESISTOR	
R01	R3AXBJ561A	Oxide Metal Film 560 1W ±5%

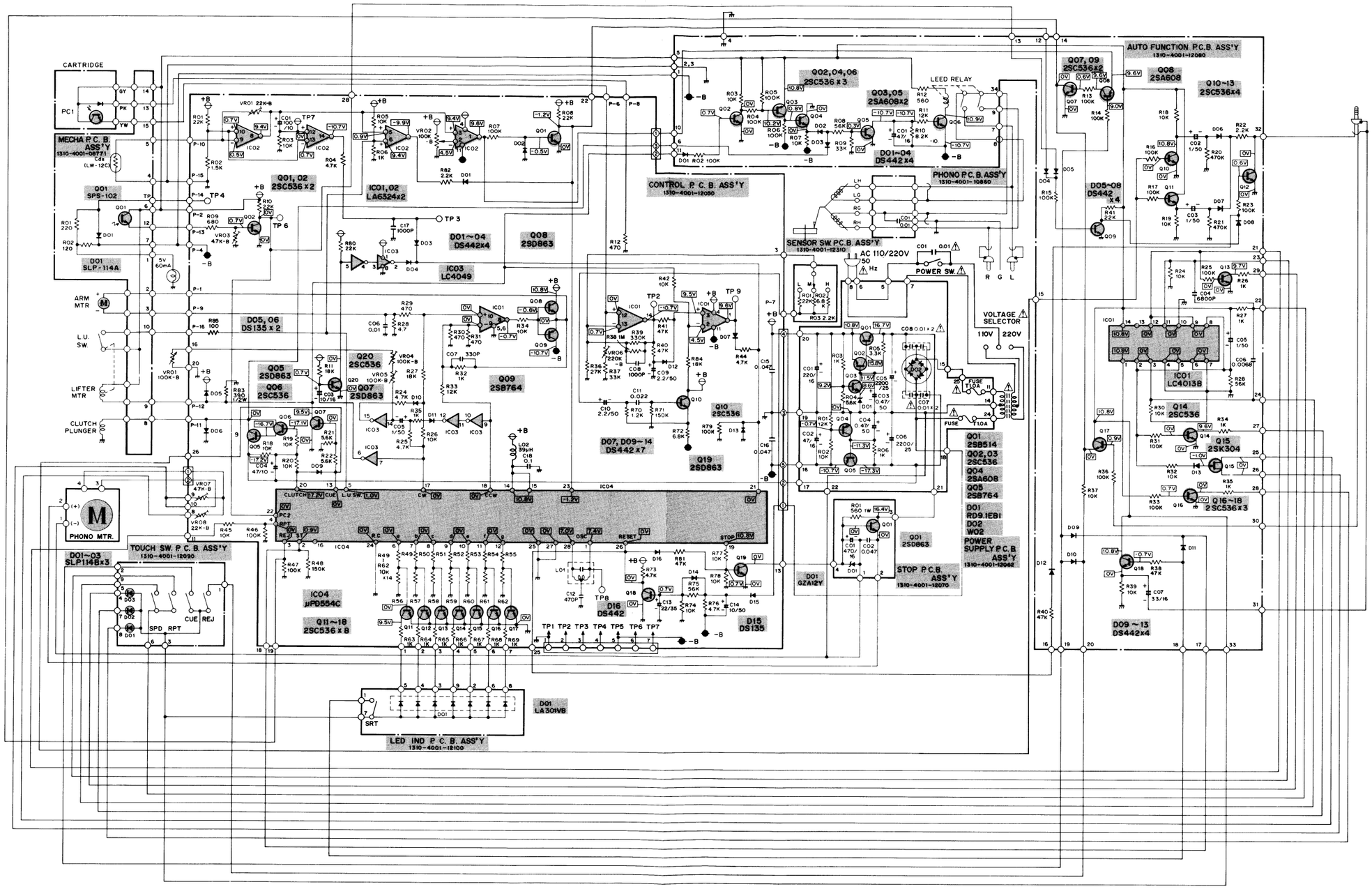
SENSOR SWITCH P.C.B. Assy
131 0 4001 12310

Ref. No.	Parts Number	Description
	4 2312 02120	Switch Slide
	RESISTORS	
R01	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R02	R2EDZJ682APA	Carbon 6.8k 1/4W ±5%
R03	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%

POINT TO POINT WIRING DIAGRAM



SCHEMATIC DIAGRAM



PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

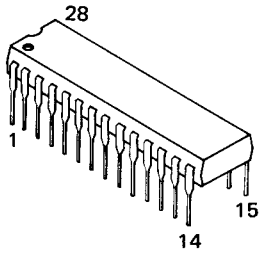
NOTES:

1. All resistors values are indicated in "ohm" (K=10^3, M=10^6).
2. All capacitors values are indicated in "μF" (P=10^{-12}).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10% with respect to chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

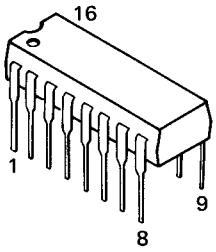
Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

SEMICONDUCTOR LEAD IDENTIFICATION

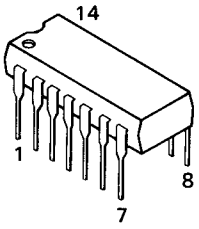
INTEGRATED CIRCUITS



- μPD554

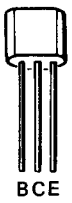


- LC4049



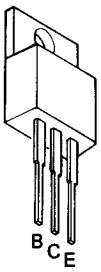
- LA6324
- LC4013

BI-POLAR TRANSISTORS



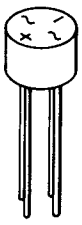
- 2SA608
- 2SC536
- 2SD863

- 2SB764

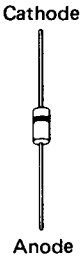


- 2SB514

DIODES



- W02



- DS-135D
- DS-442
- RD9.1